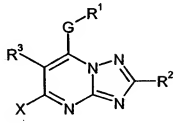
Claims

1. Triazolopyrimidines of the formula



(I)

in which

R^1 represents optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cyloalkyl or optionally substituted heterocyclyl,

R^2 represents a hydrogen, halogen, optionally substituted alkyl or optionally substituted cycloalkyl,

R^3 represents optionally substituted heterocyclyl

G represents oxygen or SO_n, wherein

n is 0, 1 or 2,

and

X represents halogen, cyano, optionally substituted alkyl, optionally substituted alkoxy, optionally substituted alkylthio, optionally substituted alkylsulphinyl or optionally substituted alkylsulphonyl.

2. The triazolopyrimidines of the formula (I) according to claim 1, in which

R^1 represents alkyl with 1 to 6 carbon atoms which can be identically or differently substituted between one and five times, by halogen, cyano, hydroxy, alkoxy with 1 to 4 carbon atoms and/or cycloalkyl with 3 to 6 carbon atoms, or

R^1 represents alkenyl with 2 to 6 carbon atoms which can be identically or differently substituted between one and three times, by halogen, cyano, hydroxy, alkoxy with 1 to 4 carbon atoms and/or cycloalkyl with 3 to 6 carbon atoms, or

R^1 represents alkynyl with 3 to 6 carbon atoms which can be identically or differently substituted between one and three times, by halogen, cyano, hydroxy, alkoxy with 1 to 4 carbon atoms and/or cycloalkyl with 3 to 6 carbon atoms, or

R^1 represents cycloalkyl with 1 to 6 carbon atoms which can be identically or differently substituted between one and three times, by halogen and/or alkyl with 1 to 4 carbon atoms, or

R^1 represents saturated or unsaturated heterocyclyl with 5 or 6 ring members and 1 to 3 heteroatoms such as nitrogen, oxygen and/or sulphur, wherein the heterocyclyl can be substituted once or twice by halogen, alkyl with 1 to 4 carbon atoms, cyano and/or cycloalkyl with 3 to 6 carbon atoms,

R^2 represents hydrogen, fluorine, chlorine, bromine, iodine, alkyl with 1 to 4 carbon atoms, haloalkyl with 1 to 4 carbon atoms and 1 to 9 halogen atoms or cycloalkyl with 3 to 6 carbon atoms,

R^3 represents saturated or unsaturated heterocyclyl with 5 or 6 ring members and 1 to 4 heteroatoms such as nitrogen, oxygen and/or sulphur, wherein the heterocyclyl can be identically or differently substituted between one and four times by

fluorine, chlorine, bromine, cyano, nitro, alkyl, alkoxy, hydroximinoalkyl or alkoximinoalkyl with respectively 1 to 3 carbon atoms per part alkyl ,

haloalkyl or haloalkoxy with respectively 1 to 3 carbon atoms and 1 to 7 halogen atoms

G represents oxygen or SO_n, wherein

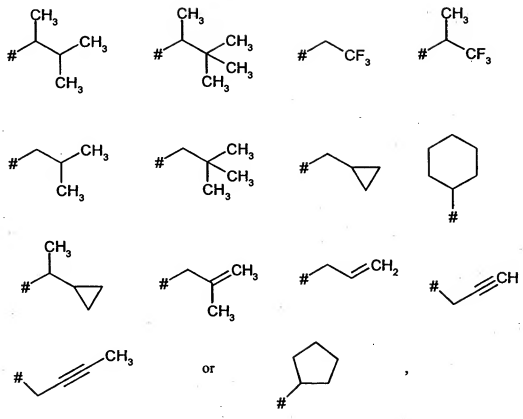
n is 0, 1 or 2,

and

X represents fluorine, chlorine, bromine, cyano, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkyl sulphinyl with 1 to 4 carbon atoms or alkyl sulphonyl with 1 to 4 carbon atoms.

3. The triazolopyrimidines of formula (I) according to claim 1 or claim 2, in which

R^1 represents a residue of the formula



where # marks the linking point,

R^2 represents hydrogen, fluorine, chlorine, bromine, iodine, methyl, ethyl, isopropyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, trifluoromethyl, 1-trifluoromethyl-2,2,2-trifluoroethyl or heptafluorisopropyl,

R^3 represents pyridyl which is linked in the 2- or 4-position and can be identically or differently substituted between one and four times by fluorine, chlorine, bromine, cyano, nitro, methyl, ethyl, methoxy, methylthio, hydroximinomethyl, hydroximinoethyl, methoximinomethyl, methoximinoethyl and/or trifluoromethyl, or

R^3 represents pyrimidyl which is linked in the 2- or 4-position and can be identically or differently substituted between one and three times by fluorine, chlorine, bromine, cyano, nitro, methyl, ethyl, methoxy, methylthio, hydroximinomethyl, hydroximinoethyl, methoximinomethyl, methoximinoethyl and/or trifluoromethyl, or

R^3 represents thienyl which is linked in the 2- or 3-position and can be identically or differently substituted between one and three times by fluorine, chlorine, bromine, cyano, nitro, methyl, ethyl, methoxy, methylthio, hydroximinomethyl, hydroximinoethyl, methoximinomethyl, methoximinoethyl and/or trifluoromethyl, or

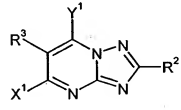
R^3 represents thiazolyl which is linked in the 2- , 4- or 5-position and can be identically or differently substituted once or twice by fluorine, chlorine, bromine, cyano, nitro, methyl, ethyl, methoxy, methylthio, hydroximinomethyl, hydroximinoethyl, methoximinomethyl, methoximinoethyl and/or trifluoromethyl,

G represents oxygen or sulphur and

X represents fluorine, chlorine, bromine, cyano, methyl, methoxy or methylthio.

4. A method for producing triazolopyrimidines of formula (I) according to one or more of claims 1 to 3, characterised in that

(a) dihalogentriazolopyrimidines of the formula



(II)

in which

R^2 and R^3 have the meanings given in claim 1,

X^1 represents halogen and

Y1 represents halogen,

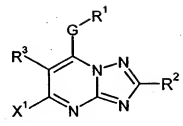
are reacted with compounds of the formula

$$R^1\text{-}G\text{-}H \qquad \text{(III)}$$

in which

R^1 and G have the meanings specified in claim 1,

optionally in the presence of a diluent, optionally in the presence of an acid acceptor and optionally in the presence of a catalyst and optionally the triazolopyrimidines thus obtained of the formula



(Ia)

in which

R^1, R^2, R^3, G and X^1 have the meanings specified above,

are either reacted

α) with compounds of the formula

$$R^4\text{-Me} \qquad \text{(IV)}$$

in which

R^4 represent optionally substituted alkoxy, optionally substituted alkylthio, optionally substituted alkylsulphinyl, optionally substituted alkylsulphonyl or cyano and

Me represents sodium or potassium,

optionally in the presence of a catalyst,

or

ß) with Grignard compounds of the formula

$$R^5\text{-MgHal} \qquad \text{(V)}$$

in which

R^5 represents optionally substituted alkyl and

Hal represents chlorine or bromine,

in the presence of a diluent.

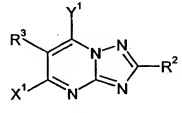
5. Means for combating undesirable micro-organisms, characterised in that it contains of at least one triazolopyrimidine of formula (I) according to one or more of claims 1 to 3 in addition to extenders and/or surfactants.

6. The use of triazolopyrimidines of formula (I) according to one or more of claims 1 to 3 for combating undesirable micro-organisms.

7. A method for combating undesirable micro-organisms, characterised in that triazolopyrimidines of formula (1) according to one or more of claims 1 to 3 are applied to the undesirable micro-organisms and/or their habitat.

8. A method for producing means for combating undesirable micro-organisms, characterised in that triazolopyrimidines of formula (I) according to one or more of claims 1 to 3 are mixed with extenders and/or surfactants.

9. Dihalogen-triazolopyrimidines of the formula



(II)

in which

R^2 represents hydrogen, halogen, optionally substituted alkyl or optionally substituted cycloalkyl ,

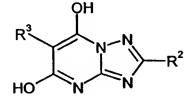
R^3 represents optionally substituted heterocyclyl ,

X^1 represents halogen and

Y1 represents halogen.

10. A method for producing dihalogen-triazolopyrimidines of formula (II) according to claim 9, characterised in that

(b) dihydroxy-triazolo-pyrimidines of the formula



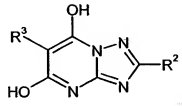
(VI)

in which

R^2 and R^3 have the meanings given in claim 9,

are reacted with halogenating agents, optionally in the presence of a diluent.

11. Dihydroxy-triazolo-pyrimidines of the formula



(VI)

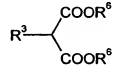
in which

R^2 represents hydrogen, halogen, optionally substituted alkyl or optionally substituted cycloalkyl and

R^3 represents optionally substituted heterocyclyl.

12. A process for preparing dihydroxy-triazolo-pyrimidines of formula (VI) according to claim 11, characterised in that

(c) heterocyclyl malonic esters of the formula



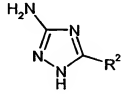
(VII)

in which

R^3 has the meaning specified in claim 11 and

R^6 represents alkyl with 1 to 4 carbon atoms,

are reacted with aminotriazoles of the formula



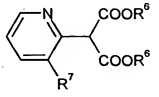
(VIII)

in which

R^2 has the meaning given in claim 11,

optionally in the presence of a diluent and optionally in the presence of an acid binder.

13. A pyridyl malonic ester of the formula



(VII-a)

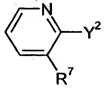
in which

R^6 represents alkyl with 1 to 4 carbon atoms and

R^7 represents halogen or haloalkyl.

14. A process for preparing pyridyl malonic esters of formula (VII-a) according to claim 13, characterised in that

(d) pyridine halides of the formula



(IX)

in which

R^7 has the meaning specified in claim 13 and

Y^2 represents halogen,

are reacted with malonic esters of the formula

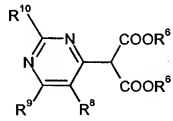
(X)

in which

R^6 has the meaning specified in claim 13,

optionally in the presence of a diluent, optionally in the presence of a copper salt and optionally in the presence of an acid acceptor.

15. A pyrimidyl malonic ester of the formula



(VII-b)

in which

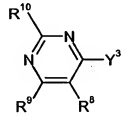
R^6 represents alkyl with 1 to 4 carbon atoms,

R^8 represents halogen or haloalkyl and

R^9 and R^{10} independently of one another represent hydrogen, fluorine, chlorine, bromine, methyl, ethyl or methoxy .

16. A process for preparing pyrimidyl malonic esters of formula (VII-b) according to claim 15, characterised in that

(e) pyrimidine halides of the formula



(XI)

in which

R^8, R^9 and R^{10} have the meanings specified in claim 15 and

Y^3 represents halogen,

are reacted with malonic esters of the formula

(X)

in which

R^6 has the meaning specified in claim 15,

optionally in the presence of a diluent, optionally in the presence of a copper salt and optionally in the presence of an acid acceptor.